EX PARTE OR LATE FILED

October 31, 1996

EX PARTE

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W.- Rm. 222
Washington, D.C. 20554

Re: CS Docket No. 96-45

Dear Mr. Caton:

We are submitting for inclusion in the docket of the above-referenced proceeding a report which represents a continuing evaluation of cost proxy models for sizing the universal service fund. Specifically, the report presents an analysis of the similarities and differences between the Hatfield Model and the BCM2.

If you have any questions concerning this matter, please contact the undersigned.

Sincerely,

Richard Cimerman
Teresa Pitts
Directors, State Telecommunications Policy

CC: Joint Board Members

CONTINUING EVALUATION OF COST PROXY MODELS FOR SIZING THE UNIVERSAL SERVICE FUND

Analysis of the Similarities and Differences between the Hatfield Model and the BCM2

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Lee L. Selwyn

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Preface | CONTINUING EVALUATION OF COST PROXY MODELS FOR SIZING THE UNIVERSAL SERVICE FUND

In reports completed in April 1996, May 1996 and August 1996, Economics and Technology, Inc. evaluated the original BCM and the BCM2 as potential cost proxy models to be used in sizing and distributing universal service support. In this report, recognizing the importance of the Hatfield Model as an alternative cost proxy model to be used in universal service proceedings, ETI has undertaken an evaluation of the newest release of this model. Furthermore, because of continuing interest in the differences between the BCM2 and the Hatfield Model, ETI has also identified and analyzed some of the major attributes of these two models that converge and the major attributes that diverge in order to assist in regulators' deliberations on the key characteristics of any cost proxy model.

A cursory cross-comparison of the results yielded by the Hatfield Model and the BCM2 for a single state illustrates the large gap between the USF requirement that the two models purport are necessary to achieve universal service. The BCM2 yields a universal service fund requirement (assuming a price threshold of $30) of $131-million for the state of Washington. Assuming the same price threshold of $30, the Hatfield Model computes a universal service fund requirement of $8.5-million for the state of Washington. In this report, we attempt to identify the major causes of the substantial difference between the size of the USF derived by these two cost proxy models.

This report was prepared by Economics and Technology, Inc. on behalf of the National Cable Television Association in order to provide a critical assessment of the strengths and weaknesses of the Hatfield Model, and also to respond to regulators' interest in cross-comparisons of the Hatfield Model with the BCM2. The project was conducted under the overall direction of Susan M. Baldwin and Dr. Lee L. Selwyn. Contributing to this work were Scott C. Lundquist, Patricia D. Kravtin, Helen E. Golding, Paul S. Keller, Michael J. DeWinter, Sonia N. Jorge, Jenny H. Yan, and Melissa N. Markley. The project also benefitted from the suggestions and ideas of Richard L. Cimerman, Director, State Telecommunications Policy, NCTA and Teresa A. Pitts, Director, State Telecommunications Policy, NCTA. The views in this report are those of ETI and do not necessarily reflect the views of the NCTA.

October 1996

Economics and Technology, Inc.
Boston, Massachusetts 02108 USA

Executive Summary

CONTINUING EVALUATION OF COST PROXY MODELS FOR SIZING THE UNIVERSAL SERVICE FUND

In the year that has passed since the submission of the original Benchmark Cost Model (BCM) and the five months since the Federal Communications Commission established the Federal-State Joint Board to make recommendations for implementing the universal service provisions of the *Telecommunications Act of 1996*, diverse parties to the universal service debate have devoted very considerable effort to developing a cost proxy model that quantifies the cost of universal service in the future. As the Joint Board prepares for its final deliberations, it will need to evaluate the relative merits of three models that have been submitted for consideration, the Benchmark Cost Model 2 (BCM2) developed by US West and US Sprint, Pacific Telesis's Cost Proxy Model, and the latest version of the Hatfield Model, sponsored by AT&T and MCI.

The National Cable Television Association (NCTA) recognized early on the importance of developing a reliable cost proxy model that would help to quantify the cost of universal service based on the forward-looking cost of providing basic local exchange service, based upon objective factors, so as to be compatible with the pro-competitive policies of the *Telecommunications Act.* In April, in conjunction with comments filed in Docket 96-45, NCTA submitted a comprehensive analysis of the original BCM, focusing on the strengths and weaknesses of the BCM as a tool for achieving the universal service and local competition policy goals and mandates of the *Telecommunications Act.*[1] A subsequent ETI report, submitted by NCTA to the Commission and Joint Board in August 1996, compared BCM2 and, to a lesser extent, CPM to the original BCM, and analyzed whether and to what extent these "second generation" models improved on the various shortcomings identified in the April report.[2] At the time of ETI's August report, the Hatfield model was not complete, and ETI therefore was unable to undertake a comprehensive examination of that model in

1. *The Cost of Universal Service, A Critical Assessment of the Benchmark Cost Model,* Baldwin, Susan M. and Lee L. Selwyn, Economics and Technology, Inc., April 1996.

2. *Converging on a Cost Proxy Model for Primary Line Basic Residential Service*, Baldwin, Susan M. and Lee L. Selwyn, Economics and Technology, Inc., August 1996.

the available time. Now, to continue the process of cost proxy model comparisons, ETI has examined the relative strengths and weaknesses of the Hatfield model, on a stand-alone basis and relative to BCM2.

Inevitably, the first place that comparisons are drawn is the bottom line, and a cursory cross-comparison of BCM2 and the Hatfield Model reveals a large gap in the bottom-line funding requirement. The bottom line does not tell the whole story, however, and in particular offers no explanation as to the reasons for the differences. This report breaks down the various areas of divergence in the models' methodologies and assumptions, explains how they affect the overall results, and analyzes the relative strengths of the alternative approaches. The results are presented primarily in the form of tables, to focus attention on the numerical effects of the assumptions and methods being compared.

A principal and overarching strength in the Hatfield Model is its use of forward-looking costs, versus the BCM2's continued reliance on embedded costs. Because the Hatfield Model uses forward-looking costs, rather than historic, embedded costs, it is substantially less likely to result in support levels which will permit recipients of universal service support (primarily incumbent LECs) to cross-subsidize competitive ventures. As previous reports have demonstrated, no amount of precision in the remainder of the model can successfully reverse the adverse effects of choosing the wrong cost (i.e., embedded cost) basis.

Another area of significant strength in the Hatfield Model is the flexibility it provides the regulators to specify state-specific assumptions for such critical inputs as rate of return and depreciation. This permits state regulators to adjust the Hatfield Model to reflect state-specific public policy decisions, that are essentially overridden in BCM2. It also overcomes a specific flaw in BCM2, the use of the interstate rate of return rather than a composite that recognizes the (often lower) returns authorized at the state level.

The Hatfield Model is not without shortcomings, however, and could benefit from certain specific changes that have been recommended in earlier ETI reports, and, in some cases, incorporated into the competing models. For example, independent company data is not included and the current macro-driven user interface fails to save all worksheets of the individual modules to the workfile, thereby constraining certain analyses, and further does not presently compute USF needs at the wire center level. Also, unlike BCM2, the Hatfield Model still does not produce costs for the entire country, but rather is limited to the Bell operating companies, plus Southern New England Telephone.

In the final analysis, the Joint Board and Commission will need to pick and choose among the best attributes of the cost proxy models that have been presented. In so doing, the Commission and Joint Board must remain focused on the reason why universal service policy is being revisited at this time, which is to adopt a universal service funding

mechanism that promotes and does nothing to hinder the development of competition in local exchange service. As the April report explains in detail, a representation of USF requirements is not complete if it merely shows the cost side of the USF equation. Existing sources of universal service support are not in imminent jeopardy. Thus, to arrive at a determination of universal service support requirements, the existing revenues available to support universal service, along with a realistic assessment of the price level that is affordable for customers to pay, must be offset against the costs resulting from any proxy model.

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Purpose of evaluation

In three previous reports, ETI has evaluated the original Benchmark Cost Model and the Benchmark Cost Model 2 (BCM2).[1] Particularly in the August Report, our analysis occasionally compares certain attributes of the BCM2 to two other cost proxy models that have been submitted for possible use in universal service proceedings, the Hatfield Model and the California Proxy Model. Because the newest release of the Hatfield Model was anticipated but not yet public at the time of our August Report, we referred in general terms to an earlier version of the model. The purpose of this report is to continue the discussion that we began in April 1996, and to contribute to the continuing debate about the use and design of cost proxy models in universal service funding decisions.

Economics and Technology, Inc. has undertaken a preliminary evaluation of the *Hatfield Model Version 2.2, Release 2* (Hatfield Model), which was submitted in CC Docket No. 96-45 as an *ex parte* presentation.[2] The Hatfield Model Sponsors filed the following:

- Written documentation of the Hatfield Model, which includes a user's manual;
- Paper copies of the Unit Cost and Universal Service sheets from the Expense Module for all 49 BOC plus SNET study areas; and
- A CD-ROM with relevant files for all 49 BOC plus SNET areas.

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1. *The Cost of Universal Service, A Critical Assessment of the Benchmark Cost Model,* Baldwin, Susan M. and Lee L. Selwyn, April 1996 (hereinafter "April Report"); *The BCM Debate, A Further Discussion*, Baldwin, Susan M., Helen Golding, and Lee L. Selwyn, May 1996 (hereinafter "May Report"); *Converging on a Cost Proxy Model for Primary Basic Residential Service: A Blueprint for Designing a Competitively Neutral Universal Service Fund*, Baldwin, Susan M. and Lee L. Selwyn, August 1996 (hereinafter "August Report").

2. See September 10, 1996 letter from Richard N. Clarke of AT&T to William F. Caton, Acting Secretary of the FCC.

By November 8, 1996, the Federal-State Joint Board on Universal Service must make a recommendation to the Federal Communications Commission (FCC) on numerous matters relating to universal service.[3] The purpose of this report is to assist the Joint Board in making its findings and recommendations, specifically regarding the use of cost proxy models in sizing and distributing a universal service fund.

Approach to evaluation

As a threshold matter, ETI fully endorses the use of a cost proxy model for the purpose of sizing and distributing monies from a universal service fund *provided that such model is a forward-looking model that reflects economically efficient inputs and algorithms, recognizes the substantial economies of scale and scope inherent in ILEC networks, and computes the cost of providing primary basic residential local exchange service.*[4] We do not advocate the use of a cost proxy model simply for the sake of a cost proxy model, because one that exaggerates costs by, for example, incorporating excessive capacity or overstated carrying charges will simply create an oversized universal service fund, which is incompatible with the goal of competition in the local market.[5] The status quo (i.e., the NECA-administered interstate high cost fund) would be preferable to the adoption of an unrealistic cost proxy model.[6] Although, in such an instance, certain changes would be required in order for the high cost to comply with *The Telecommunications Act of 1996* (for example, funds must be made available to other eligible carriers).

Three cost proxy models have been submitted to the FCC in the universal service proceeding: Pacific Telesis' California Proxy Model; AT&T's and MCI's Hatfield Model;

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3. The Hatfield Model has also been introduced in various state universal service proceedings. For example, a task force, established by the Colorado Public Utilities Commission, is presently evaluating the strengths and weaknesses of cost models for universal service. Colorado PUC Docket No. 95R-558T, *In the Matter of Proposed Rules Regarding Implementation of 4,6 §§ 40-15-101 et. seq. — Requirements Relating to the Colorado High Cost Fund,* Decision Adopting Rules, April 1, 1996. Colorado PUC Docket No. 95R-558T, *In the Matter of Proposed Rules Regarding Implementation of 4,6 §§ 40-15-101 et. seq. — Requirements Relating to the Colorado High Cost Fund,* Commission Decision on Applications for Rehearing, Reargument and Reconsideration and Adopting Rules, April 25, 1996.

4. We recognize that a universal service fund would be available for any eligible carrier, but for the foreseeable future the incumbent local exchange carriers will be the primary beneficiaries of high cost funds.

5. As a point of reference, the existing high cost fund distributes approximately $750-million in interstate funds.

6. For comprehensive discussions of the attributes of a useful cost proxy model and related issues, please refer to ETI's three previous reports.

and US West's and Sprint's Benchmark Cost Model 2.[7] Furthermore, the BCM2 sponsors and the CPM sponsors have indicated that they have discussed the possibility of merging their two models.[8]

Similar to our approach for evaluating the BCM and the BCM2, we have approached our evaluation of the Hatfield Model with the following purposes:

1. Identify and understand the key inputs, algorithms, and assumptions.

2. Where feasible, assess the significance of various attributes of the model to the results (i.e., conduct sensitivity analyses of key inputs and algorithms).

3. Identify the major strengths and weaknesses of the model, specifically regarding its potential use as a policy making tool in universal service proceedings.

4. Where our analysis leads us to additional questions for the model sponsors, include specific suggested "data requests" that the Joint Board or the FCC should submit to the Hatfield Model and BCM2 Sponsors.

We have continued to focus our "hands-on" analysis on runs of single states. We have also begun to address one of the questions that regulators have raised regarding a cross-comparison of the BCM2 and the Hatfield Model.[9] One of the important aspects of the answer to this question is the identification of where and how these two models diverge. The models clearly diverge in results when they are run using their respective default values: The BCM2 yields a universal service fund requirement (assuming a price threshold of $30) of $131-million for the state of Washington and the Hatfield Model computes a USF requirement of $8.5-million. When the BCM2 is run only on the BOC regions of Washington, the USF is $40-million for the same price threshold.

In order to complete this assignment, ETI examined the Hatfield Model, accompanying documentation, and responses filed with the FCC to questions posed by the FCC and the

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7. The earlier version of the Benchmark Cost Model, which was submitted by US West, Sprint, MCI, and NYNEX, is no longer endorsed by its original sponsors. The earlier Hatfield Model, Version 2.2 Release 1, which was made public on May 30, 1996, is now replaced by Version 2.2 Release 2 (HM 2.2.2).

8. *Response of Sprint Corporation and US West, Inc. to Questions Posed on the Benchmark Cost Model 2 by the Federal Communications Commission and the Federal-State Joint Board Staff in the Universal Service Proceeding (CC Docket No. 96-45)*, filed August 22, 1996, see letter from Warren D. Hannah, Sprint Corporation and Glen H. Brown, US West, Inc. to William F. Caton, Acting Secretary, FCC (see response to Question No. 6: "The sponsors of both the CPM and BCM2 are, along with representatives from several other companies, looking into the possibility of merging the two models by using the strongest parts of each.").

9. NARUC Summer Committee Meetings, July 22, 1996, Los Angeles, CA.

Joint Board Staff.[10] ETI also reviewed testimony, transcripts and interrogatory responses that were submitted in the investigation of cost proxy models submitted as part of the investigation that is now pending in New Jersey.[11]

Comparability of the BCM2 and the Hatfield Model

We have examined the Hatfield Model as one distinct task, and then also, in order to contribute to discussions as to the reasons for the differences between the results yielded by the two models, we have attempted to isolate key inputs and algorithms. This exercise has, itself, been challenging, because in several important instances, comparability is not always readily feasible. Chapter 5 summarizes our analysis of this topic.

The Hatfield Model and the BCM2 yield very different results and offer different kinds of policy making tools for a number of reasons, which can be categorized as follows:

1. *Differences in what we refer to below as "general attributes."* An example of a general attribute is the fact that the Hatfield Model presently only computes high cost support for BOC-served regions of the country (plus SNET) while the BCM2 can be readily used to compute high cost support for the entire country. This fundamental difference among the models thus has two consequences: (1) it explains part of the difference in the level of USF computed by the model[12] and (2) the current versions of the models answer different high-cost questions. Table 1.1 compares some key general attributes of the two models.

2. *Differences in default inputs or assumptions.* An example of a differing assumption is the discount for switching equipment: the Hatfield Model incorporates an

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10. *Response of AT&T Corp. and MCI Telecommunications Corporation to Questions Posed on the Hatfield Model by the Federal Communications Commission and the Federal-State Joint Board Staff in the Universal Service Proceeding (CC Docket No. 96-45)*, filed August 19, 1996, see letter from Michael Pelcovits, MCI Telecommunications Corporation and Joel Lubin, AT&T Corp. to John S. Morabito, Deputy Chief, Accounting and Audits Division, Common Carrier Bureau, FCC, re *Ex Parte Presentation*, CC Docket No. 96-45. See also *Supplemental Response of AT&T Corp. and MCI Telecommunications Corporation to Questions Posed on the Hatfield Model*, filed August 26, 1996, see letter from Michael Pelcovits, MCI Telecommunications Corporation and Joel Lubin, AT&T Corp. to John S. Morabito, Deputy Chief, Accounting and Audits Division, Common Carrier Bureau, FCC, re *Ex Parte Presentation*, CC Docket No. 96-45 ("AT&T/MCI Supplemental Response").

11. Before the New Jersey Board of Public Utilities, *Notice of Investigation of Local Exchange Competition for Telecommunications Services*, Docket No. TX95120631.

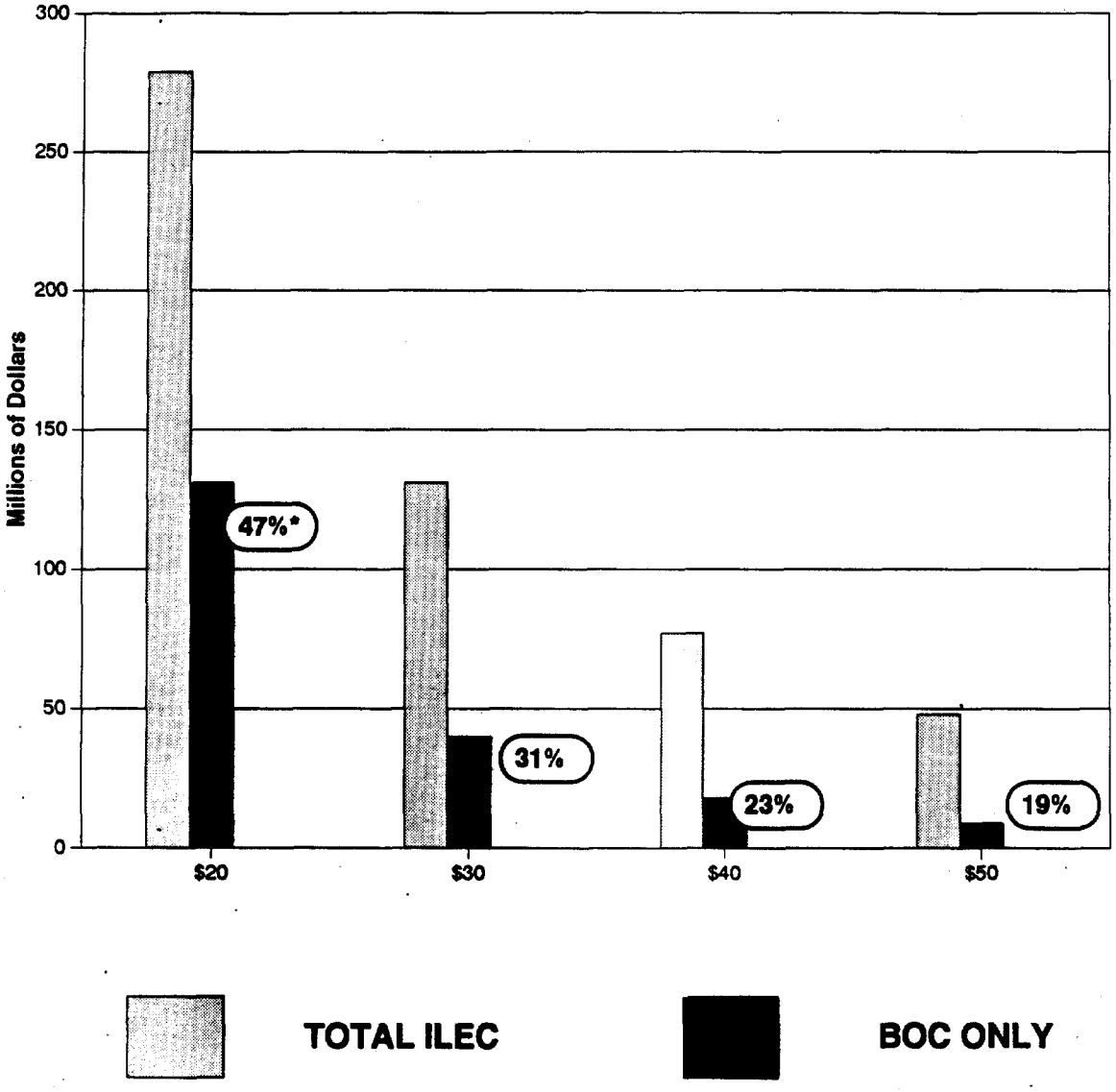
12. See Figure 1.1 which shows that at price thresholds of $20, $30, and $40, respectively, US West accounts for approximately 47%, 31%, or 23% of the USF support for the state of Washington. The fact that these percentages decline as the price threshold increases implies that the most costly regions are disproportionately served by non-BOCs.

implied discount of 50% while the BCM2 explicit default input is 20%, which, in turn, results in a relatively lower cost than that yielded by the BCM2.

Figure 1.1

Comparison of BOC Portion of USF Requirement with Total ILEC USF Requirement as Computed by the BCM2:

Washington State (default values)



***The percentages represent the portion of the USF that would support US West**

3. *Differences in design.* The Hatfield Model deploys far fewer distribution legs within a CBG than the BCM2 does, which, in turn, results in a lower cost than that yielded by the BCM2.

The three tables below summarize some of the major ways in which the Hatfield Model and the BCM2 differ. In the sections following these three tables, we discuss these particular characteristics of the model in more detail.

Table 1.1

Hatfield Model vs. BCM2
Comparison of General Attributes

Attribute	Hatfield Model	BCM2
Coverage	BOCs and SNET; ability to extrapolate to ICOs	All Tier 1 and Tier 2 LECs
Average national cost provided?	No	Yes
Total national USF provided?	No	Yes
Are any cells locked?	Yes	Yes
Purpose of model	TELRIC/USF	USF
Software to run	Excel	Excel
Census data	1995 Estimate	1990 Data
Business lines included in network?	Yes	Yes
Scope of basic local exchange service	Broader	Narrower
CBGs classified among six zones?	Yes	Yes
Cost results	Expressed on an unseparated basis	Expressed on an unseparated basis
USF Calculation	Based upon price thresholds	Based upon price thresholds
USF Calculation	Evaluated at the density zone level	Evaluated at the CBG level
Readily permits USF evaluation at wire center level	Not readily, but this is possible	Not readily, but this is possible
Flows through full benefits of economies of scale and scope	No	No

Table 1.2

Hatfield Model vs. BCM2
Comparison of Default Inputs (Explicit and Implicit)

Default Inputs	Hatfield Model	BCM2
Default ROR	10.01%	11.25%
Depreciation	See Table 2.3	"Approved lives"; see Table 2.3
Discount for digital switches	50%	20%
Fill factors, feeder	lower than BCM2	higher than Hatfield Model
Fill factors, distribution	higher than BCM2 for three least densely populated zones; identical for Zone 4; lower than BCM2 for two most populated zones	lower than Hatfield Model for three least densely populated zones; identical for Zone 4; higher than BCM2 for the two most populated zones
Copper/fiber crossover	9,000 feet of feeder	12,000 feet of combined feeder and distribution

Table 1.3

Hatfield Model vs. BCM2
Comparison of Design Differences

Algorithm	Hatfield Model	BCM2
Copper-Fiber Crossover	distance is user-adjustable	four distance options for the user
Copper-Fiber Crossover	distance measured is the feeder	distance measured is the feeder and the distribution
Digital switch discount	hard-wired	user-adjustable
Categories of outside plant[1]	aerial, buried, underground	aerial, underground
Fill factors, outside plant	user-adjustable	user-adjustable
Allocation of structure costs to telephony	33%	100%
Wireless investment cap	No	Yes
Slope effect	Not explicitly	Yes

Note: [1] Underground plant includes additional placement costs beyond those required for buried plant (e.g., conduit, additional trenching, and costs associated with pulling the cable through the conduit).

In Tables 1.4, 1.5 and 1.6, below, we summarize some of the major *differences in results.*

Table 1.4

Comparison of Hatfield Model versus BCM2
Washington State - US West Only

Default Values
Listed Separately by Density Zone

	BCM2	Hatfield Model		
Density Zone	**Average Monthly Cost**	**Average Monthly Cost[1]**	**Average Monthly Cost Difference**	**Percent Difference**
0-5	$109.28	$87.61	($21.67)	(20%)
5-200	41.26	31.42	(9.84)	(24%)
200-650	26.35	19.49	(6.86)	(26%)
650-850	27.15	17.05	(10.10)	(37%)
850-2550	24.55	16.12	(8.43)	(34%)
2550+	21.62	14.17	(7.45)	(35%)

[1] Assumes local number portability is available.